Installation instructions

Accessories

PA Control Panels

POWER AUTOMATION

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Original installation instructions

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1 General information

1.1 Information on this manual

General Information

This installation manual provides important information on how to work with the control unit safely and efficiently.

The installation manual is part of the control unit, must always be kept in the control unit's direct proximity and should be available for the personnel at any time. All personnel working with the control unit are obliged to have read and understood this installation manual before starting any work. Strict compliance with all specified safety notes and instructions is a basic requirement for safety at work.

Moreover, the accident prevention guidelines and general safety regulations applicable at the place of use of the control unit must also be complied with.

Illustrations in this installation manual are intended to facilitate basic understanding, and may differ from the actual design of the control unit.

The enclosed manuals for the installed components apply together with this installation manual.

1.2 Explanation of symbols

Warnings

Warnings are identified by pictures. These warnings are introduced by signal words, which express the severity of a danger.

Pay attention to these warnings and act cautiously in order to avoid accidents, personal injuries and damage to property.

⚠ DANGER	**… indicates an imminently hazardous situation which, if unavoidable, will result in death or serious injury.**
⚠ WARNING	**… indicates a potentially hazardous situation which, if unavoidable, could result in death or serious injury.**
⚠ CAUTION	**… indicates a potentially hazardous situation which, if unavoidable, may result in minor or moderate injury.**
NOTICE	**… indicates a potentially hazardous situation which, if unavoidable, may result in property damage.**
	… emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

Special Safety Notes

The following symbols are used in connection with the safety notes to highlight particular dangers:

⚠ DANGER

… highlights hazards caused by electric current. There is a danger of serious injury or death if the safety notes are not complied with.

Additional symbols and highlighting

The following symbols and highlights are used to distinguish instructions, descriptions of results, cross-references and other elements inside this manual.

→ .. Highlights a step as part of a procedure of instructions.

⇨ .. Highlights a state or an automatic process as a result of an instruction.

■ .. Highlights single or unordered instructions and lists.

↳ *"Additional symbols and highlighting" on page 6*.. Highlights cross-references to chapters or sections of this manual.

[Key].. Highlights captions of buttons, fields and other elements of the software's graphical user interface.

"Menu ➔ *Submenu* ➔ *"*.. Highlights a path to access a menu or submenu in the software's graphical user interface.

`Example/Extract`.. Highlights verbatim examples and extracts from configuration files.

1.3 Limitation of liability

Liability

All information and notes in this installation manual were compiled under due consideration of valid standards and regulations, the present status of technology and our years of knowledge and experience.

Power Automation can not be held liable for damage resulting from:

- disregarding this installation manual
- unintended use
- employment of untrained personnel
- unauthorized conversions
- unauthorized modifications to the software
- technical modifications
- use of unapproved spare parts
- use in conjunction with machines not deemed compatible by Power Automation

In case of customized versions the actual scope of delivery can vary from the explanations and representations in this installation manual, because of the utilization of additional options or due to the latest technical changes.

Apart from this, the obligations agreed upon in the delivery contract, the general terms and conditions, and the delivery conditions of Power Automation and the legal regulations valid at the time of contract apply.

We reserve the right to make technical modifications in order to improve usability.

1.4 Copyright

Copyright

This installation manual is protected by copyright law.

Passing this installation manual on to third parties, duplication of any kind – even in form of excerpts – as well as the use and/or disclosure of the contents without the written consent of Power Automation is not permitted.

Violations oblige to compensation. The right for further claims remains reserved.

1.5 Warranty terms

Material Warranty

The material warranty terms are provided in Power Automation's terms and conditions as well as inside the sales documents.

1.6 Customer service

Service

Our Customer Service is always available for technical information.

For information on whom to contact by phone, fax, e-mail or via the internet, see Power Automation's address on page 2.

Additionally, Power Automation staff is always interested in receiving new information and experiences resulting from the use of our products, which could be of great value for future improvements.

1.7 Glossary

CMOS - Complementary metal-oxide-semiconductor

CNC - Computerized Numerical Control

DDU - Delivered Duty Unpaid

HMI - Human Machine Interface

The graphical user interface provided by the PA software.

IPC - Insulating Piercing Connector

MDI - Manual Data Input

MTBP - Machine Tool Builder's Panel

Panel including the basic requirements for a machine tool operator: emergency stop push button, cycle start and stop push buttons, jog plus and minus push buttons, feed rate and spindle speed override pots and a number of auxiliary push buttons.

NC-Start - Numerical Control Start Button

NC-Stop - Numerical Control Stop Button

PA - Power Automation

PAMIO - Power Automation Modular Input Output

Extendable Superbus based interface allowing connection of additional I/O modules.

PASIO - Power Automation Slot Input Output

Extendable EtherCAT® based interface allowing connection of additional I/O modules.

PC - Personal Computer

PCI - Peripheral Component Interconnect

Personal computer extension for periphery devices connected to the motherboard.

PLC - Programmable Logic Controller

POU - Program Organization Unit PLC functions, function blocks and programs are POUs

RMS - Rotating Measuring Systems (Encoder)

General information

2 Safety

2.1 Customer's responsibility

The control unit is used for commercial purposes. The operating company is thus subject to the legal obligations concerning industrial safety.

The safety, accident prevention and environmental protection regulations applicable for the area of application of the machine must be complied with, along with the safety notes specified in this installation manual. The following applies in particular:

- The customer must become familiar with the industrial safety regulations and identify additional dangers which may arise due to the specific working conditions at the place of use of the control unit, by means of a risk analysis. These must be converted into operating instructions for operation of the control unit.
- Throughout the time of use of the control unit the customer must check whether the operating instructions created by him correspond to the current status of regulations and standards. Whenever changes in regulations and standards occur, instructions must be adapted accordingly.
- The customer must clearly specify the responsibilities for installation, operation, maintenance, and cleaning.
- The customer must make sure that all employees who have to work with the control unit have read and understood these operating instructions.

  In addition, the customer must train and inform his personnel about potential dangers at regular intervals.

Moreover, the customer is also responsible for keeping the control unit in technically good condition, and therefore the following applies:

- The customer must make sure that the maintenance intervals specified in these operating instructions are complied with.
- The customer must regularly check all safety features for function and completeness.
- The customer must supply his personnel with the necessary protective equipment.

2.2 Personnel requirements

2.2.1 Qualifications

⚠ WARNING

Danger of injury in case of insufficient qualification!

- **Only those persons who have been specified in the corresponding chapters of this installation manual should be entrusted with the listed types of work.**
- **Employ certified experts, if in doubt.**

Improper operation can lead to severe personal injuries and/or material damage.

The following qualifications are specified for different areas of activity listed in the installation manual.

Qualified personnel
are able to carry out assigned work and to recognize possible dangers due to professional training, knowledge, and experience as well as profound knowledge of applicable regulations.

2.2.2 Unauthorized persons

⚠ WARNING

Danger for unauthorized persons!

- **Keep unauthorized persons away from the working area.**
- **If in doubt, address such persons and ask them to leave the working area.**
- **Interrupt your work as long as unauthorized persons are in the working area.**

Unauthorized persons, who do not meet the requirements described in this installation manual, are not aware of the dangers in the working area.

Only persons who are expected to perform their tasks reliably are permitted as personnel. Persons whose reaction capability is impaired, e.g. through drugs, alcohol or medication are not permitted.

- When selecting personnel, ensure that the personnel can work with the control unit in terms of technical and content aspects.

2.3 Intended use

Intended Use

The control unit is exclusively intended and built for the use described in this installation manual.

The control unit is to be used exclusively to control CNC machines of a supported number of axes which are in accordance with the types cleared by Power Automation. Prerequisite for the intended use of the control unit is proper configuration as described in the installation manuals provided by Power Automation.

Dangers

⚠ WARNING

Beware of unintended use!

- **Operate the control unit as intended only.**
- **Observe all instructions in this installation manual.**
- **Observe the permissible ambient conditions and electromagnetic compatibility mentioned in the technical data.**

Any use exceeding the scope of intended use and/or different application of the control unit can result in hazardous situations.

Claims of any kind for damage resulting from unintended use are void.

The operator is solely responsible for all damage resulting from unintended use.

2.4 Unintended use

Unintended Use

⚠ WARNING

Beware of unintended use!

- **In particular, avoid using the control unit for the following purposes as these are regarded as not intended:**
  - **Operation using software not approved by Power Automation.**
  - **Operation connected to machines/drives not deemed compatible by Power Automation.**
  - **Operation using wrong number of axes**
  - **Wrong or missing execution of the maintenance intervals**
  - **Operation by not instructed personnel**

2.5 Personal protective gear

Wearing of personal protective gear is required to minimize health hazards and damage when working with the control unit.

- Always wear the protective equipment that is necessary for the respective task when working.
- Follow the instructions on personal protective equipment that are listed in this installation manual and other installation manuals provided by Power Automation.
- The environment in which the control unit is installed may require users to wear additional personal protective gear.

  Observe the instructions on personal protective gear provided by the operating company.

Antistatic gloves
for protection of the hands during the work. Wear the antistatic gloves always until the work is finished.

ESD clothing
for protection of components susceptible to electrostatic discharge. Wear the ESD clothing during the work on electrostatic components.

ESD safety pad
for protection of components susceptible to electrostatic discharge. Put the ESD safety pad on the floor before starting to work.

ESD safety shoes
for protection of components susceptible to electrostatic discharge. Wear the ESD safety shoes to protect electrostatic-discharge-sensitive devices due to inadequate derivative electrostatic energy.

Ear protection
for protection of the ears during the work. Wear the ear protection always until the work is finished.

Ground strap
for protection of components susceptible to electrostatic discharge. Wear the ground strap on your wrist and connect it to a suitable equipotential bonding.

Protective glasses
for protection of the eyes during the work. Always wear the protective glasses until the work is finished.

2.6 Conduct in a dangerous situation and in case of accidents

Preventive Measures

- Stay informed about locations of first aid equipment (first aid kit, covers, etc.) and fire extinguishers at the site of installation.
- Instruct personnel about accident reporting, first aid and rescue facilities at the site of installation.

In Case Of Accidents

- Disconnect power supply immediately.
- Initiate first aid measures.
- Inform responsible persons at the site.
- Call for rescue service if applicable.

2.7 Environmental protection

⚠ CAUTION

Environmental hazard caused by incorrect handling!
Incorrect handling of environmentally hazardous substances, especially incorrect waste disposal, can cause considerable damage to the environment.

The following environmentally hazardous components or substances are contained in the control unit:

Electronic Components

Electronic components are considered special waste. They must be properly disposed of.

Power Automation will accept the control unit to properly dispose of its components upon decommissioning.

- Follow the standard return procedure, as described in ↳ *Chapter 6.3 “Return policy and procedure” on page 45*.

Safety

3 Overview

The following products belong to the PA Control Panels:

Product	Code	Description	See
Displays, Panels and Cables	CP170-T	17" Touch Control Panel	*Chapter 4.1 "17" touch control panel" on page 19*
	CAB USB	10m cable extension set for CP170-T	*Chapter 4.2.1 "USB touch screen cable with 10m length" on page 24*
	STP170-MCP	Smart Touch Panel 17" incl. Machine Control Panel (MCP)	*Chapter 4.3 "Smart Touch Panel 17" incl. Machine Control Panel" on page 25*
	STP170-MCP Lab Set	Labelling Set for MCP Switches	*Chapter 4.3.2 "Machine Control Panel (MCP)" on page 35*
	CAB STP170-5	5m cable set including DVI, USB and MCP I/O cable	*Chapter 4.3.1.3 "Connection to the Control unit" on page 30*
	CAB STP170-10	10m cable set including DVI, USB and MCP I/O cable	*Chapter 4.3.1.3 "Connection to the Control unit" on page 30*

Overview

4 Control Panels

4.1 17" touch control panel

Version

This control panel is available in this version:

Code: **CP170-T**

The display of this control panel is designed for SXGA screen:
"1280 x 1024 pixels"

The touch screen of this control panel is of resistive type.

The CP170-T comes with an external power supply that is to be placed near to the control panel.

4.1.1 Technical Data

4.1.1.1 General Specifications

General Information

Property	Value	Unit
Dimensions (WxHxD)	482 x 354 x 54	mm
	18.97 x 13.94 x 1.97	inch
Weight	7.15	kg
	15.77	lb

4.1.1.2 Connection values

Electrical

External power supply

Property	Value	Unit
Input voltage	115 - 240	V AC
Tolerance	+10 / -15	%
Frequency	47 - 63	Hz
Maximum power consumption	45	W

4.1.1.3 Operating conditions

General

Property	Value	Unit
Operating temperature	+5 - +45	°C
	+41 - +113	°F
Storage temperature	-20 - +60	°C
	-4 - +140	°F
Relative humidity (non-condensing)	80	%
Maximum acceleration (non-operating)	1	G
Maximum acceleration (operating)	0.25	G
Protection class (front side)	IP65	

4.1.1.4 Dimension sheet

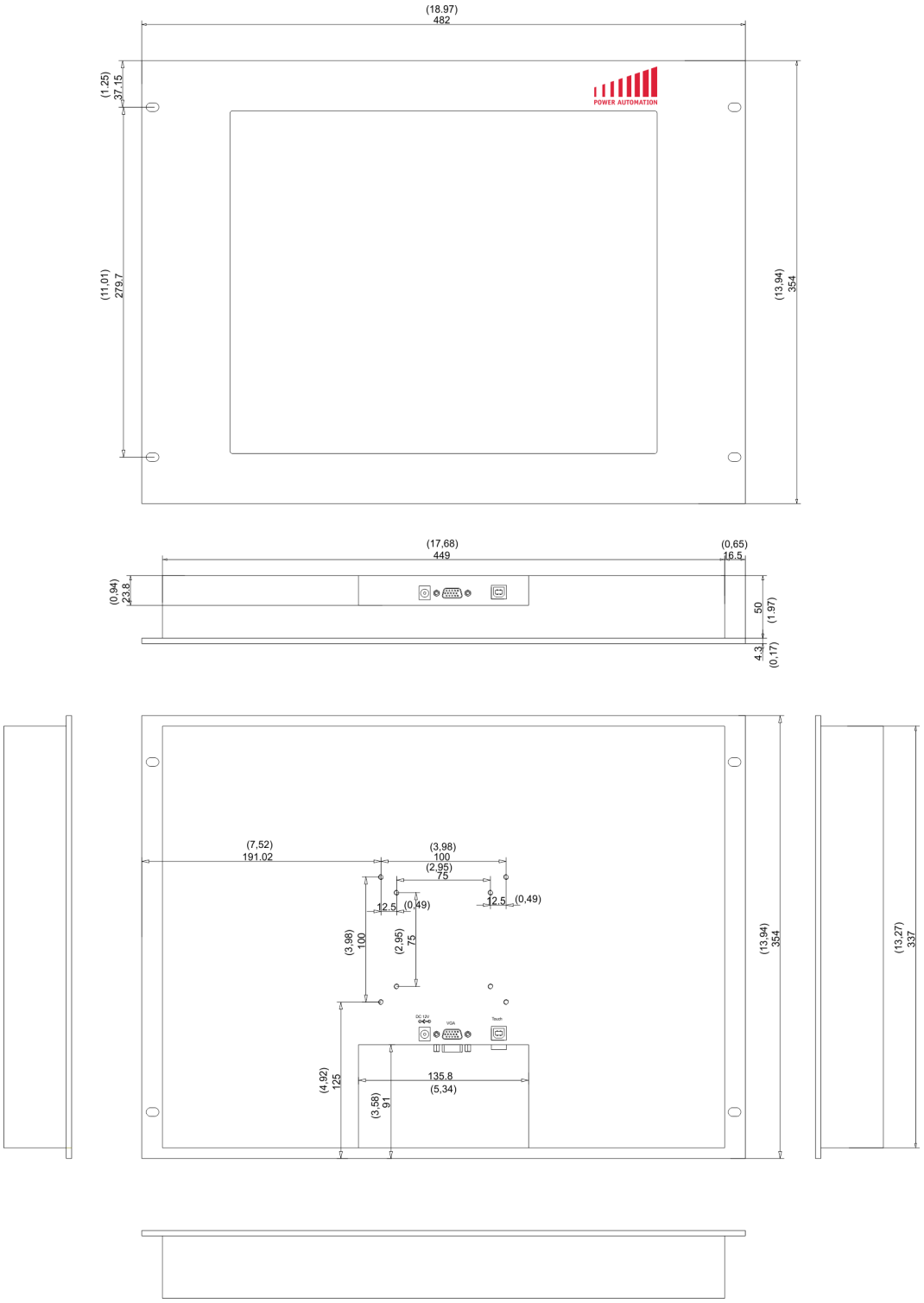

Fig. 1: Dimension sheet

Dimensions are given in mm with inch values in parentheses.

4.1.2 Installation

Mounting

1. Follow the ergonomic guidelines.
2. Allow free space on all sides of the unit for cooling.
3. When locating the control panel, consider the effect that room lighting will have on the control screen.
4. The control panel must be rigidly secured to a solid mounting surface.
5. It is recommended that 80mm (3.15") or more clearance be allowed behind the units for access to cabling.
6. Locate the Operator Display and Console at least 300mm (12") from areas where they may be influenced by electrical noise (e.g. transformers, coils, drive amplifiers, relays etc.).

For optimum usability, it is recommended to set the top of the control panel at eye level if the display is oriented vertically. If the display is tilted backward, the display should be mounted lower with the top of the display still roughly perpendicular to the line of sight of the operator.

4.1.3 Connection to the Control unit

Connection

For wiring purpose, three connectors are located at the rear of the control panel (see Fig. 2).

Fig. 2: CP170-T Connectors

- The control panel CP170-T requires an external power supply (included in the scope of delivery) providing a 12V DC voltage. This power supply is connected to the corresponding DC 12V input connector.
- The display has to be connected by means of the delivered VGA cable to the VGA output connector X4 of the PA control unit. The standard length of the PA VGA cable is 2m (78.74").
  A cable in 10m (32.8 feet) length is optionally available.

- The touch screen has to be connected to the USB dongle of the PA control unit where the software driver for the touch screen has been installed. See *Chapter 4.2 “Touch Screen USB Connection on the Control unit” on page 24*).
- Use the delivered cable. The standard length of the PA USB cable is 2.5m (98.425").
  A cable set for 10m (32.8 feet) connection is available. See *Chapter 4.2.1 “USB touch screen cable with 10m length” on page 24*).

The quality of the display as well as those of the touch screen function significantly depends on the quality of the cables used. Always choose original cable parts from Power Automation.

4.2 Touch Screen USB Connection on the Control unit

Software Driver

The touch screen requires the installation of a software driver. Power Automation installs the required driver on control units delivered with the operator panel CP170-T. Thus during installation, one of the USB ports is affected for the touch screen functionality.

The touch screen can be connected to one of the installed USB ports of the Control unit.

4.2.1 USB touch screen cable with 10m length

USB Repeater

This cable is available in this version:

Code: **CAB USB**

When cable sets are delivered for a length of 10m, the USB connection is constituted of two 5m (16.4 feet) USB cables with USB repeater module at one end (see Fig. 3). The intermediate connection is protected and fixed by a heatshrink tube.

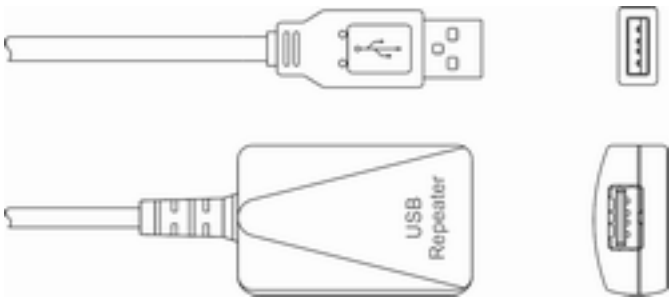

Fig. 3: USB Repeater

4.3 Smart Touch Panel 17" incl. Machine Control Panel

Version

The Smart Control Panel (STP170) incl. Machine Control Panel (MCP) is available in this version:

Code: **STP170-MCP**

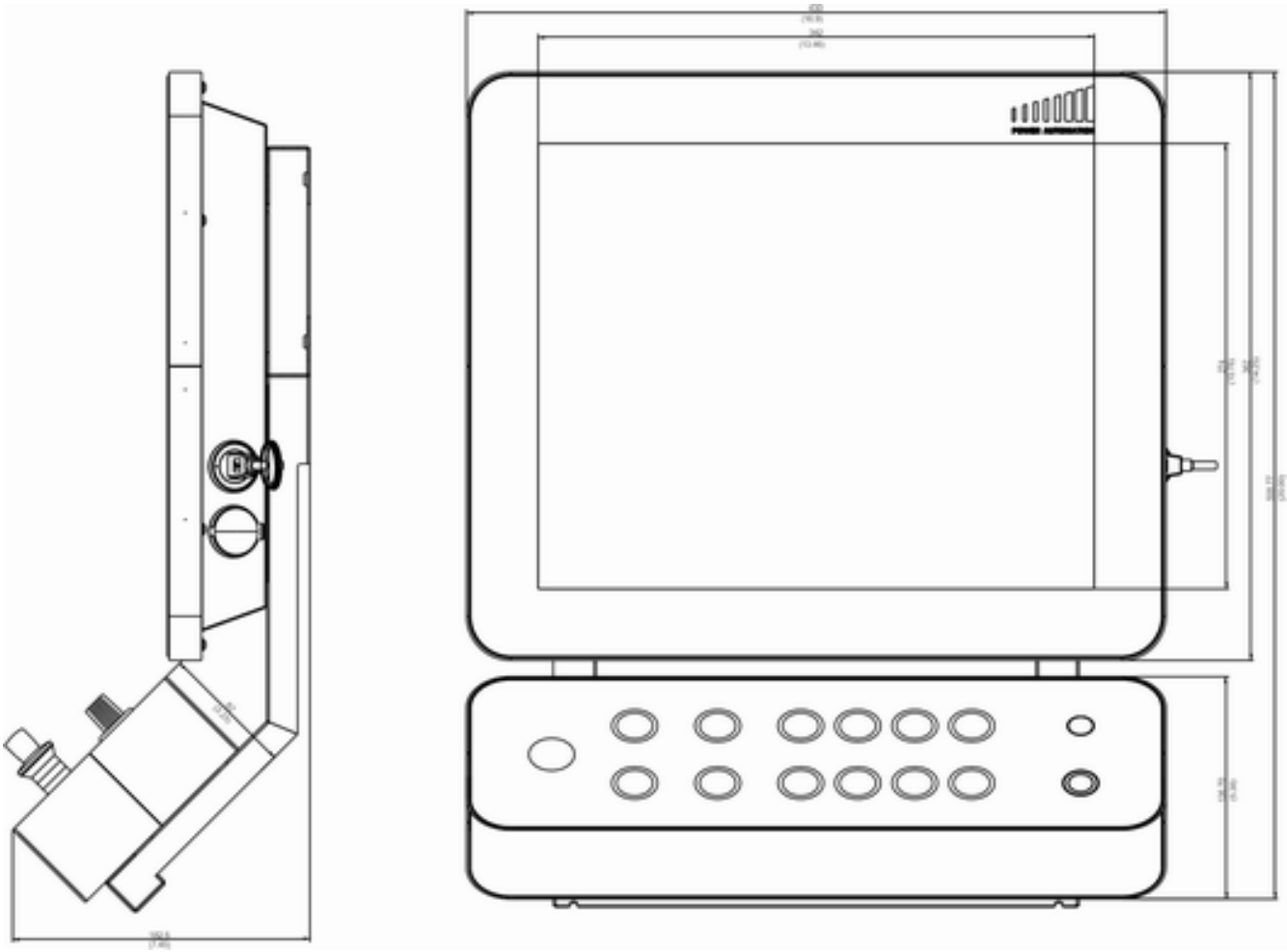

Fig. 4: STP170 with connected MCP

Dimensions are given in mm with inch values in parentheses.

4.3.1 Smart Touch Panel STP170

STP170

The display of this control panel is designed for SXGA screen:
"1280 x 1024 pixels"

The touch screen of this control panel is of protected capacitive type (PCAP).

The STP170 is supplied with 24V, which is available in every industrial environment.

4.3.1.1 Technical Data

4.3.1.1.1 General Specifications

General Information

Property	Value	Unit
Dimensions (WxHxD)	430 x 362 x 61	mm
	16.93 x 14.25 x 2.4	inch
Weight	7.5	kg
	16.53	lb

4.3.1.1.2 Connection values

Electrical

External power supply

Property	Value	Unit
Input voltage	24	V DC
Tolerance	+10 / -15	%
Maximum power consumption	24	W

4.3.1.1.3 Operating conditions

General

Property	Value	Unit
Operating temperature	+5 - +45	°C
	+41 - +113	°F
Storage temperature	-20 - +60	°C
	-4 - +140	°F
Relative humidity (non-condensing)	80	%
Maximum acceleration (non-operating)	1	G
Maximum acceleration (operating)	0.25	G
Protection class (front side)	IP65	

4.3.1.1.4 Dimension sheet

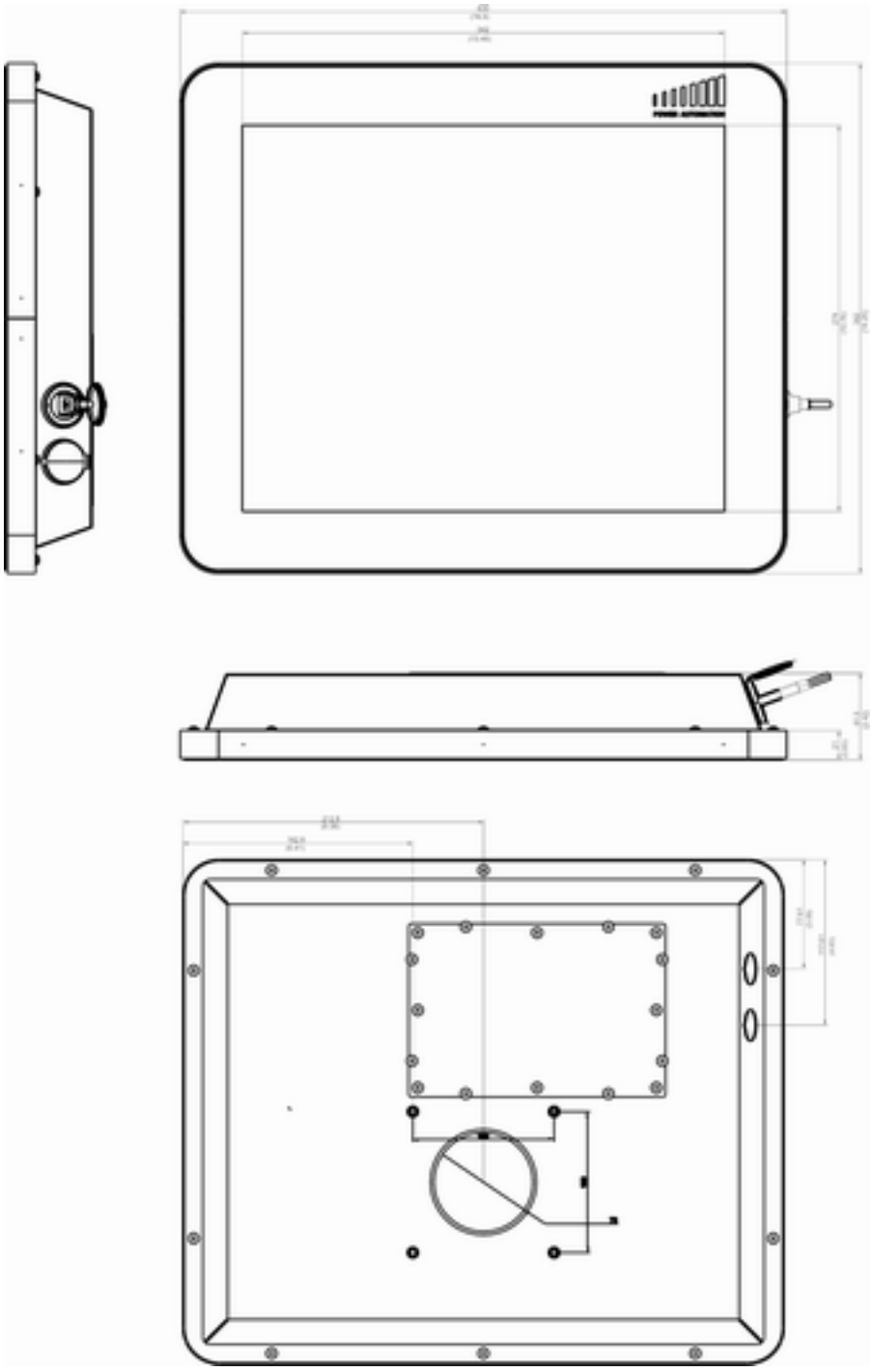

Fig. 5: Dimension sheet

Dimensions are given in mm with inch values in parentheses.

4.3.1.2 Installation

Mounting

1. Follow the ergonomic guidelines.
2. Allow free space on all sides of the unit for cooling.
3. When locating the control panel, consider the effect that room lighting will have on the control screen.
4. The control panel must be rigidly secured to a solid VESA arm.
5. Locate the Operator Display and Console at least 300mm (12") from areas where they may be influenced by electrical noise (e.g. transformers, coils, drive amplifiers, relays etc.).

For optimum usability, it is recommended to set the top of the control panel at eye level if the display is oriented vertically. If the display is tilted backward, the display should be mounted lower with the top of the display still roughly perpendicular to the line of sight of the operator.

4.3.1.3 Connection to the Control unit

Connection

For wiring purpose, three connectors are located at the rear of the control panel (see Fig. 6).

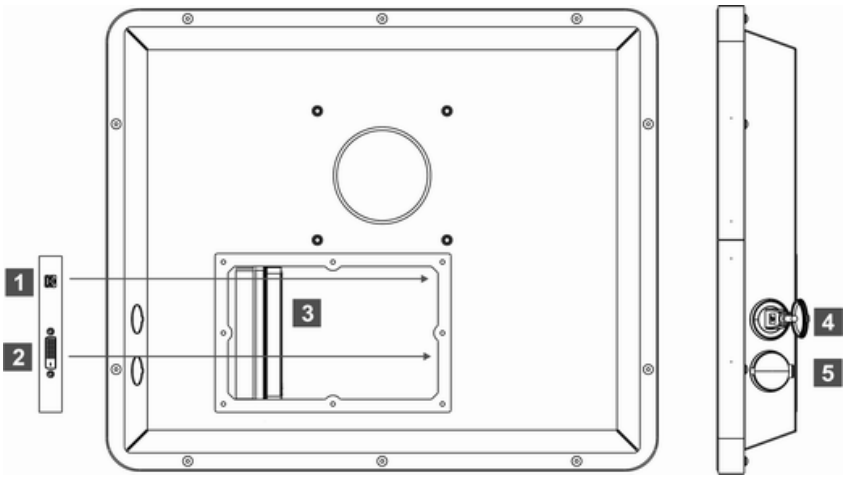

Fig. 6: STP170 Connectors

1 USB Connector (Type B)
2 DVI Connector
3 Connector for CAB STP170-MCP IO EXT
4 USB Connector (Type A)
5 USB Connector (Type A)

USB 2.0 Connector (1)

The USB port allow connection of USB peripherals.

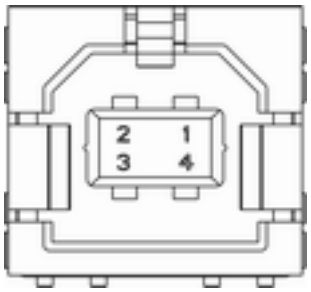

Fig. 7: USB connector (Type B)

Property	Value
Pins	4
Connector type	USB 2.0 Type B
Max length	5 m (16.5 ft)

Pin (Fig. 7)	Assignment USB
1	D-
2	VBUS
3	GND
4	D+
Shell	Shield

DVI Connector (2)

Digital Visual Interface (DVI) is a video display interface developed by the Digital Display Working Group (DDWG). The digital interface is used to connect a video source, such as a display controller to a display device, such as a computer monitor.

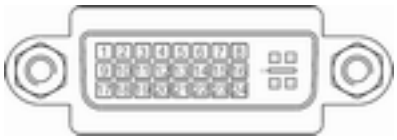

Fig. 8: DVI connector

Pin (Fig. 8)	Assignment
1	TMDS data 2−
2	TMDS data 2+
3	TMDS data 2/4 shield
4	TMDS data 4−
5	TMDS data 4+
6	Clock
7	Data
8	SYNC
9	TMDS data 1−
10	TMDS data 1+
11	TMDS data 1/3 shield
12	TMDS data 3−
13	TMDS data 3+
14	+5 V
15	GND
16	Hot plug detect
17	TMDS data 0−
18	TMDS data 0+
19	TMDS data 0/5 shield
20	TMDS data 5−
21	TMDS data 5+
22	TMDS clock shield

Pin (Fig. 8)	Assignment
23	TMDS clock+
24	TMDS clock−
C1	RED
C2	GREEN
C3	BLUE
C4	SYNC
C5	GND

USB 2.0 Connectors (4, 5)

The USB ports allow connection of USB peripherals.

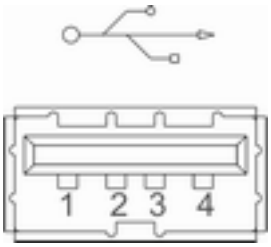

Fig. 9: USB connectors (Type A)

Property	Value
Pins	4
Connector type	USB 2.0 Type A
Max length	5 m (16.5 ft)

Pin (Fig. 9)	Assignment USB
1	VBUS
2	D-
3	D+
4	GND
Shell	Shield

- The control panel STP170 requires an external power supply (not included in the scope of delivery) providing a 24V DC voltage. This power supply is connected to the corresponding connector (see Fig. 6/3).
- The display has to be connected to the DVI output connector X4 of the PA control unit. The according cable is provided in a cable set which must be ordered separately. The available length of this cable set is 5m and 10m.
- The touch screen has to be connected to a free USB output of the PA control unit. An according cable is provided in a cable set which must be ordered separately.
- There are two cable sets defined:
  - **CAB STP170-5**: 5m cable set including DVI, USB and MCP I/O cable
  - **CAB STP170-10**: 10m cable set including DVI, USB and MCP I/O cable

The quality of the display as well as those of the touch screen function significantly depends on the quality of the cables used. Always choose original cable parts from Power Automation.

4.3.1.4 Cleaning

Cleaning Of The Display

The display of the STP170-MCP has to be cleaned with a commercially available neutral cleaning agent and a soft cleaning cloth.

After cleaning the display has to be dried with a soft cleaning cloth.

⚠ CAUTION

Don't use detergent cleaning agents or scratchy cleaning cloths to clean the display of the STP170-MCP.

4.3.2 Machine Control Panel (MCP)

General

The machine control panel (MCP) (Fig. 10) must be wired separately.

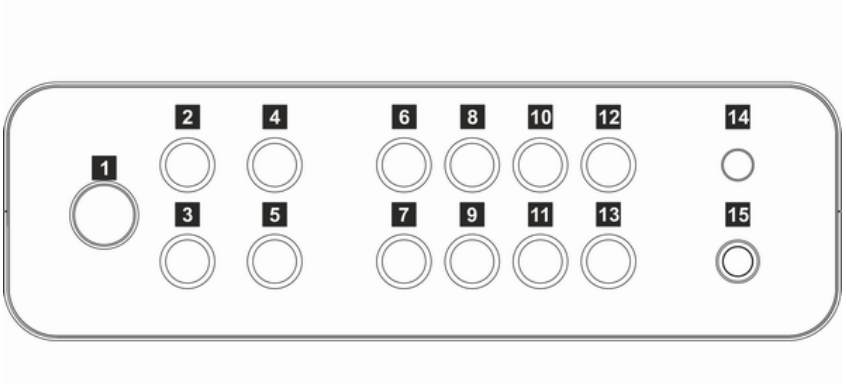

Fig. 10: Machine Control Panel (MCP) Switch Layout

1 Emergency Stop
2 Drive ON
3 Drive OFF
4 Start
5 Stop
6 Switch 1
7 Switch 2
8 Switch 3
9 Switch 4
10 Switch 5
11 Switch 6
12 Switch 7
13 Switch 8
14 Feed Override
15 Joystick

PA STP170-MCP Labelling Set

With the PA labelling set it is possible to label the Switches 1 to 8 (Fig. 10/ 6 - 13) individually. The set includes several labels to describe the individual switches (Fig. 11).

Fig. 11: Labels (examples)

Furthermore there is also a tool to open the switch covers to insert the labels (Fig. 12).

Fig. 12: Labeling tool

The PA Labelling Set is available in this version:

Code: **PA STP170-MCP Lab Set**

Replacement Of The Labels

- Set the labelling tool at the push botton with the round side (see Fig. 13.
- Move the Labelling Tool slightly up and pull it carefully (see Fig. 14).
- Abstract the old label from the push button cover if applicable.
- Put a new label into the push button cover.
- Push the push botton cover with the new label into the respective position.

Fig. 13: Set the labelling tool at the push button cover

Fig. 14: Pull the push button cover

4.3.3 Machine Control Panel Connection to the STP170

General

The MCP is pre-wired to two cables. Each cable has a 25pole Sub-D connector. These two connectors may be connected to the according connectors of the extension cable **STP 170-MCP CAB EXT**, which is available in 5m and 10m versions (see *Chapter 4.3.3.1 "STP170-MCP Connection Cable" on page 38*).

4.3.3.1 STP170-MCP Connection Cable

Connection To The Control Unit

This cable is available in this version:

Code: **STP170-MCP CAB EXT**

This cable is used for connection of the signals and 24V power supply of the STP170-MCP to the PA control unit in the electronic cabinet. The connector side is used for connection to the STP170-MCP.

Fig. 15: STP170-MCP CAB EXT

The Connector must be connected to the cable **CAB STP170 MCP IO PS (KP522xxx)** of the Smart Touch Panel (STP170). This cable is included in the cable set **CAB STP170-x**.

The following cable belong to the scope of delivery of the STP170 incl. Machine Control Panel (STP170-MCP):

– *CAB STP170 MCP IO PS (KP522xxx)*

The other side must be routed to the switch cabinet, where most signals are connected to the control unit. Only the Emergency Stop signals should be routed directly to the according safety relay in the switch cabinet.

Signal Assignment

The signal assignment of the cables is shown in *Table on page 39*:

Color	Signal name	Wire to		Color	Signal name	Wire to
White	24V SPT170	24V Power Supply		Brownblue	Joystick X-	24V CNC Input
Brown	24V SPT170	24V Power Supply		Whitered	Joystick X+	24V CNC Input
Green	0V SPT170	0V Power Supply		Brownred	Joystick Y-	24V CNC Input
Yellow	0V SPT170	0V Power Supply		Whiteblack	Joystick Y+	24V CNC Input
White (45)	24V MCP1	24V Power Supply		Brownblack	SW1 SIG	24V CNC Input
Brown (46)	24V MCP2	24V Power Supply		Greygreen	SW1 LED	24V CNC Output
Green (47)	0V MCP2	0V Power Supply		Yellowgrey	SW2 SIG	24V CNC Input
Yellow (48)	0V MCP2	0V Power Supply		Pinkgreen	SW2 LED	24V CNC Output
Grey	Drive ON SIG	24V CNC Input		Yellowpink	SW3 SIG	24V CNC Input
Pink	Drive ON LED	24V CNC Output		Greenblue	SW3 LED	24V CNC Output
Blue	Drive OFF SIG	24V CNC Input		Yellowblue	SW4 SIG	24V CNC Input
Red	Drive OFF LED	24V CNC Output		Greenred	SW4 LED	24V CNC Output
Black	CNC Start SIG	24V CNC Input		Yellowred	SW5 SIG	24V CNC Input
Violet	CNC Start LED	24V CNC Output		Greenblack	SW5 LED	24V CNC Output
Greypink	CNC Stop SIG	24V CNC Input		Yellowblack	SW6 SIG	24V CNC Input
Redblue	CNC Stop LED	24V CNC Output		Greyblue	SW6 LED	24V CNC Output
Whitegreen	Em.Stop, IN1	Emergency Circuit		Pinkblue	SW7 SIG	24V CNC Input
Browngreen	Em.Stop, OUT1	Emergency Circuit		Greyred	SW7 LED	24V CNC Output
Whiteyellow	Em.Stop, IN2	Emergency Circuit		Pinkred	SW8 SIG	24V CNC Input
Yellowbrown	Em.Stop, OUT2	Emergency Circuit		Greyblack	SW8 LED	24V CNC Output
Whitegrey	Feed OVR A	24V CNC Input			Not used	Not used
Greybrown	Feed OVR B	24V CNC Input			Not used	Not used
Whitepink	Not used	Not used			Not used	Not used

Color	Signal name	Wire to		Color	Signal name	Wire to
Pinkbrown	Feed OVR SW	24V CNC Input			Not used	Not used
Whiteblue	Not used	Not used				

All signals are 24V DC. The signals are not intended to switch high currents. Please use relays in the electronic cabinet to switch signals with high currents.

The Feed Override is an incremental encoder switch. This switch has to be evaluated in the PLC program. Additionally the Feed Override includes a push button (Feed OVR SW) (Table on page 39), which can be used for general purpose.

USB-Connection

This cable is available in this version:

Code: **STP170-MCP CAB USB**

This cable is a USB connection cable for the touch signal. This cable is included in the cable set **CAB STP170-x**.

DVI-Connection

This cable is available in this version:

Code: **STP170-MCP CAB DVI**

This cable is a Digital Visual Interface (DVI) cable for the graphics signals. This cable is included in the cable set **CAB STP170-x**.

*The USB Connection cable and the DVI Connection cable are only available as a kit in combination with the **STP170-MCP CAB EXT**.*

5 Troubleshooting

General Information

The following chapter describes possible causes of faults during installation and configuration and the steps required to eliminate them.

- In the event of frequent faults, re-check if the configuration was set up as described in this installation manual.
- In the event of faults that cannot be eliminated through the following instructions, please contact Power Automation (see *Chapter 6 “Service and return process” on page 43*).

5.1 Safety notes

Personnel

- The troubleshooting procedures described in this installation manual can be performed by the operator unless otherwise marked.
- Some work may be performed only by specially trained personnel or only by Power Automation, in which case special notice is given in the description of the individual faults.
- All work on the electrical system must be performed by a qualified electrician.

Authorization

⚠ WARNING

Unauthorized troubleshooting procedures can result in injury! Improper troubleshooting procedures can result in severe personal injury or material damage.

- Observe the personnel requirements for repairs specified in the troubleshooting chart.

  If in doubt, contact Power Automation for help or support by an authorized service technician.
- Ensure that the power supply has been disconnected.
- Make sure that the assembly location is clean and well organized.
- Components that are loosely stacked or lying around can cause accidents.
- If components have been removed, ensure proper assembly, install all mounting elements and comply with screw tightening torques.

Troubleshooting

In Case Of Faults

The following general rules apply:

Personnel:
- Qualified personnel

Protective equipment:
- Ground strap
- ESD safety shoes
- ESD safety pad
- ESD clothing
- Protective glasses
- Ear protection
- Antistatic gloves

1. In the event of faults that pose immediate danger to man or machine, activate the emergency shutoff function immediately.
2. Determine the cause of the fault.
3. Disconnect the control unit from the power supply.
4. Immediately inform the person in charge of the equipment where the fault is located.
5. Depending on the type of fault, eliminate the fault or have it eliminated by an authorized specialist.

6 Service and return process

6.1 Service

Service At Power Automation

By Phone

PA's well-educated service staff is available to answer your technical questions. Due to the close co-operation with our customers, our engineers can solve problems often immediately by phone.

If on-site support is necessary, our service staff will diagnose the problem and will prepare our field service engineer beforehand. This is to make on-site service as much effective as possible

By Remote Control Software

Every PA CNC is equipped with an Ethernet interface. If you have a network on-site, you only have to integrate the CNC system to your network for world-wide-web access.

Power Automation provides a remote control software which allows our service staff to log into your CNC. This provides all the information available on the machine. They can check all the data like the PLC program, machine parameters, or the NC programs directly on the real system under real conditions. This is the fastest and most cost-effective way to solve problems.

On-Site

If necessary our service engineers will visit you to help you solve your problems on-site. Our engineers are trained continuously to be always up to date. Thereby you always can expect the best support.

Due to our service centers worldwide, our service staff can be on site normally within 24 hours at the latest.

6.1.1 Service addresses

Service Addresses

Power Automation GmbH (Headquarters)

Gottlieb-Daimler-Strasse 17/2

D-74385 Pleidelsheim

Tel: +49-7144-899-0

Fax: +49-7144-899-299

service@powerautomation.com

Service and return process

Power Automation America, Inc.
8601 Jameel Road, Suite 140
Houston, Texas 77040 USA
Tel: +1-713-263-9400
Fax: +1-281-715-2500
sales.america@powerautomation.com

Power Automation Office Turkey
Kustepe Mah. Mecidiyekoy Yolu Cad.
Trump Towers No. 12 Kule: 2 K:18
Daire no: 3211022839 Sisli / Istanbul
Turkey
Tel: +90-212-306-3280
Fax: +90-212-306-3101
sales.turkey@powerautomation.com

Shenzhen Double CNC Tech Co., Ltd
8th Floor,WeiXinDa Building
Bao Min Road 2
Xi Xiang Town
Bao'an District, Shenzhen, Guangdong
PR China

Power Automation France SARL
Cité de la Photonique
Bâtiment Pléione
11 avenue Canteranne
33600 Pessac
France
Tel: +33-559-4010-50
Fax: +33-559-4010-59
pa.france@powerautomation.com

ACE Automation

A-721, Twinrex B/D

Deokpungdong-ro 111-10, Hanam-si

Gyeonggi-do, 465-831

South Korea

6.2 Spare parts

Spare Parts

Due to the high quality of our products we can assure you that you will not need this service often. Spare parts are often urgent so Power Automation provides the relevant spare parts at the local service centers for immediate dispatch.

Our 3 service centers in Europe, North America and Asia allow us to deliver all needed parts typically within 24 hours.

Only trust PA's original parts - because every part passes our tight quality checks.

We also offer consulting services to identify the most critical parts for the machines in your production facilities. We suggest what critical stock may be required to ensure a minimum downtime of your machines. Our specialists look for common parts to keep your inventory levels at a minimum.

6.3 Return policy and procedure

Policy

Power Automation will only accept control units and components for replacement or repair, if they have been returned in adherence to the provisions given below.

- If material warranty is void or if no error is detected, a testing flat rate will be charged. For present values please contact the Power Automation Service ↬ *Chapter 6.1.1 “Service addresses” on page 43*
- If material warranty is void you will receive a repair offer.
- Before the repair starts we need a repair order from you.
- Power Automation will impose a rate for the estimate of costs which will be absorbed if a repair order is coming about.

Acquiring RMA Number

1. Contact Power Automation to receive an RMA form in Excel format. *“RMA Form” on page 47*
2. Open the 'RMA Process' form provided by Power Automation.

   Use one form for each single part you want to ship back to Power Automation.
3. Fill in the form.

   The fields marked with a red star (*) are mandatory fields.

   Only fill in the fields next to the yellow bar on the left side of the form.

   Do not fill in the fields next to the blue bar on the left side of the form. These fields are for internal notes only and blocked.
4. Send the completed form as an Excel file by email to **rma@powerautomation.com** to your local support (see web-page).

   ⇨ We will check the data and send the form back to you as a PDF file including an RMA number or tell you what information is missing if necessary.
5. Print the RMA form and add it to the accompanying components and documents.
6. After the check and repair the components will be shipped to you immediately.

Service and return process

RMA Form

RMA Formular - Vom Kunden auszufüllen / **RMA Form** - To be filled out be customer

Kontakt bei PA / Contact at PA: *

Datum / Date: * 05.06.2014

Kunde / Customer:

(Unternehmen / Company) * (Kundennummer / Customer No.) *

(Adresse / Adress) *

(Name / Name) *

(Telefon / Phone) (Fax / Fax) *

(eMail / eMail)

POWER AUTOMATION

Return of Material Authorization

Power Automation GmbH
Gottlieb-Daimler-Strasse 17/2
74385 Pleidelsheim
Germany
Phone: + 49 (0) 7144/899 - 321
Fax: + 49 (0) 7144/899 - 299
E-Mail: rma@powerautomation.com

Artikelbezeichnung / Part Description : *

☐ PA 8000 e ☐ PA 8000 L2 ☐ PA 8000 NT ☐ Zubehör / Accessories ☐ Antrieb / Drive ☐ P1, P2, other
☐ PA 8000 e2 ☐ PA 8000 LW ☐ PA 8000 EL ☐ Bedienfeld / Panel ☐ Motor

Seriennummer / Serial No.: *

Lieferschein-Nr. / Delivery Note No.: *

☐ Express
Sofortige Bearbeitung garantiert! Es entstehen zusätzliche Kosten!!

Grund der Warenrücksendung / Reason for return of the goods:

☐ Musterrücksendung / Sample Return ☐ Reparatur / Repair ☐ Andere / Other
☐ Gutschrift / Credit ☐ Umbau / Conversion

Detaillierte Fehlerbeschreibung / Detailed Error Description, Notizen / Notes, ...: *

*** = Pflichtfeld / Mandatory Field**

To be filled out by Power Automation

Interne Vermerke / Internal Notes:

☐ **RMA Nummer erteilen / Accept RMA number**

☐ RMA Nummer nicht erteilen / Reject RMA number

Zuständig bei PA / Responsible at PA:

Vermerke / Notes

RMA Nummer / RMA number:

(Unterschrift / Signature)

(Stempel / Chop)

Wichtige Hinweise / Important indications:

Außerhalb der Gewährleistung wird eine Testpauschale von 100€ berechnet / Out of warranty period a testing flat rate of 100€ will be charged
Bitte verpacken Sie die Ware angemessen / Please pack the goods in an adequate way
Steuerungen können nur in Originalverpackung oder gleichwertiger Verpackung angenommen werden / Contrds can only be accepted in original enclosures or equivalent
Power Automation haftet nicht für Transportschäden/ Power Automation does not bear any liability for damages in transit
Lieferungen werden nur FREI angenommen / Deliveries are only accepted FREE DOMICIL
Lieferungen ohne RMA Nummer werden nicht angenommen/ Deliveries without RMA Number will be rejected
Die RMA Nummer muss am Karton außen gut sichtbar sein / The RMA number must be visible well from outside the cardbox
Das RMA Formular muss den Begleitdokumenten beigefügt sein / The RMA form must be added to the accompanying documents

Fig. 16: RMA Form

Return

1. Pack the goods properly.

   Controls must be packed in original or equivalent packaging.

   NOTICE! **Damages due to inadequate packaging Inadequate packaging may result in damages to the control unit. This will void the material warranty. PA does not bear any liabilities for damages in transit.**

2. Write the RMA number on the cardboard box clearly readable from outside.

   The incoming goods department rejects all deliveries without a visible, valid RMA number.

3. Ship the goods FREE DOMICILE / DDU. Other deliveries will be rejected.

   The goods have to arrive within 4 weeks after the date of the approved RMA form.

6.4 Training

Training Courses

Having the best CNCs is one thing, to bring out the best of it is the other.

The PA training program comprises of a number of individually combinable training modules which offer you a well-founded knowledge for using PA CNCs. At our training centers we bring your employees - beginners and experts- up to scratch in CNC technology. We also offer individual training courses at your site. The contents of the courses will be customized to your requirements.

For more information see ↬ *Chapter 6.1.1 “Service addresses” on page 43*.

7 Proof of Change

Proof Of Change

Version	Change	Date
1	Preliminary Version	05/07/2015

Proof of Change

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